

## **REMARKS**

### **Status of the Claims**

Claims 1-71 are currently pending. Claims 29, 38-50, and 65-68 are allowed. Claims 1-5, 8-10, 12-22, 24-28, 30-37, 51-60, 63, 64, and 69-71 were rejected in the Office Action mailed October 3, 2003. Claims 6, 7, 11, 23, 61 and 62 are objected to as to form, but were indicated as allowable if rewritten in independent form. Claims 1, 12, 14, 20-22, 25, 30, 35-38, 46, 51, 58-60, 63, and 68-70 are currently amended, Claim 61 is canceled, and new Claims 72-82 are presented herein. Amendments to the claims are fully supported by the specification, therefore no new matter is added by these Amendments. Applicant respectfully requests reconsideration of the rejected claims in view of the Amendment submitted herein and the following remarks.

### **Scope of Claim 68**

In reference to paragraph no. 1 of the Office Action, Applicant has amended Claim 68 to recite "or" rather than "and" on line 5 of this claim, to indicate that polyacetal component can comprise a polymer of any one of these the components or any mixtures thereof. Respectfully, Applicant notes that support for this amendment is found in the specification at least at page 26 (lines 14-20) and Example 20, therefore, this amendment adds no new matter.

### **Rejection of Claims 14-21, 30-37, 51-59, 63, 64, and 69-71 Under 35 U.S.C. § 112, Second Paragraph**

Claims 14-21, 30-37, 51-59, 63, 64, and 69-71 were rejected in the October 3, 2003, Office Action under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. According to the Examiner, process Claims 14, 30, 35-37, 51, 58, 59, 63 and 69 were rejected because they do not set forth the specific steps involved.

As amended herein, Claims 14, 30, 51, 63, and 69 now recite the steps of exposing the lithographic recording medium to radiation to form a pattern, and developing the pattern. By this amendment, Applicant respectfully maintains that the rejection of Claims 14-19, 30-34, 51-57, 63, 64, and 69-71 has been obviated. Support for these amendments is found in the specification

at least at page 9 (lines 16-19), Example 4, Example 6, Example 9, Example 10, Example 15, and Example 16, therefore, no new matter has been added.

Applicant has also amended Claims 20-21 to depend from Claim 14, Claims 35-37 to depend from Claim 30, and Claims 58-59 to depend from Claim 51. Respectfully, Applicant maintains that the rejection to Claims 20-21, 35-37, and 58-59 has been obviated, as Claims 14, 30, and 51 all recite the steps of exposing the lithographic recording medium to radiation to form a pattern, and developing the pattern.

Applicant respectfully asserts that each of Claims 14-21, 30-37, 51-59, 63, 64, and 69-71 is definite under 35 U.S.C. § 112, Second Paragraph and accordingly, Applicant requests withdrawal of this rejection, and allowance of these claims.

**Rejection of Claims 14-21 30-37, 51-59, 63, 64 and 69-71 Under 35 U.S.C. § 101**

Claims 14-21 30-37, 51-59, 63, 64 and 69-71 were rejected in the October 3, 2003, Office Action under 35 U.S.C. § 101. It is the Examiner's position that a claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process.

As amended herein, Claims 14, 30, 51, 63, and 69 recite the steps of exposing the lithographic recording medium to radiation to form a pattern, and developing the pattern. Further, Claims 20-21 are amended herein to depend from Claim 14, Claims 35-37 are amended to depend from Claim 30, and Claims 58-59 are amended to depend from Claim 51.

By the amendments to Claims 14, 20-21, 30, 35-37, 51, 58-59, 63, and 69 filed herewith, Applicant respectfully maintains that the rejection of Claims 14-21, 30-37, 51-59, 63, 64, and 69-71 under 35 U.S.C. § 101 has been obviated. Accordingly, Applicant respectfully requests withdrawal of this rejection, and allowance of these claims.

**Rejection of Claims 1-5, 8-10, and 13 Under 35 U.S.C. § 102(b) in View of Kita**

Claims 1-5, 8-10, and 13 were rejected under 35 U.S.C. § 102(b) as being anticipated by Kita et al (JP 2000-334881 and its English abstract). According to the Examiner (Office Action paragraph no. 5), Kita discloses a mixture of a cage-shaped silsesquioxane and an organic polymer, thereby rendering the rejected claims unpatentable.

As amended herein, Claim 1 now recites that the nanocomposite resist comprising a nanoparticle component and a polymer component is *photoimagable*. Support for this amendment is found in the specification at least at page 14, line 24-page 15, line 7; page 18, lines 4-10; and Examples 2, 4-6, 9, and 10.

Kita (English Abstract) discloses mixing cage-shaped silsesquioxanes with a polymer, which provides a film “low in refractive index and dielectric constant . . . improved in optical characteristics like a reflection preventing film”, wherein “the strength and durability of the film is also improved” (English Abstract, last 4 lines). Applicant maintains that Kita discloses a film that appears *stable* to radiation, rather than a film that is photoimagable, as in Applicant’s amended Claim 1.

By this amendment, Applicant respectfully maintains that the rejection of Claims 1-5, 8-10, and 13 under 35 U.S.C. § 102(b) has been obviated. Accordingly, Applicant respectfully requests withdrawal of this rejection, and allowance of these claims.

**Rejection of Claims 22, 24, 26, and 28 Under 35 U.S.C. § 102(e) in View of Hiraoka**

Claims 22, 24, 26, and 28 are rejected under 35 U.S.C. § 102(e) as being anticipated by Hiraoka et al (US 6,391,471B1). According to the Examiner (Office Action, paragraph no. 6), Hiraoka discloses a triblock polymer containing a methacrylate component and a POSS component.

As amended herein, Claim 22 now recites a polymeric chemically amplified resist comprising: a methacrylate component comprising at least one methacrylate-containing comonomer; and a polyhedral oligosilsequioxane component comprising at least one polyhedral oligosilsequioxane-containing comonomer; wherein the methacrylate-containing comonomer is *different than* the polyhedral oligosilsequioxane-containing comonomer. As recognized by the Examiner, Hiraoka discloses a triblock polymer containing a methacrylate component and a POSS component, in which the methacrylate component and a POSS component are part of the same repeating unit or same comonomer of the polymer. Support for Applicant’s amendment is found in the specification at page 15 (lines 11-28); page 16 (lines 5-10); Figure 1; and Examples 7 and 8; therefore this amendment adds no new matter.

Further, and in view of the amendment of Claim 22, Applicant respectfully maintains that Claim 24, drawn to glass transition temperature, and Claim 28, drawn to polydispersity, are not anticipated by Hiraoka, for at least the reason that Hiraoka's tri-block copolymer (XIV) does not anticipate Applicant's polymeric resist of Claim 22.

By this amendment, Applicant respectfully maintains that the rejection of Claims 22, 24, 26, and 28 under 35 U.S.C. § 102(e) has been obviated. Accordingly, Applicant respectfully requests withdrawal of this rejection, and allowance of these claims.

**Rejection of Claims 22 and 25-27 Under 35 U.S.C. § 102(e) in View of Sellinger**

Claims 22 and 25-27 are rejected under 35 U.S.C. § 102(e) as being anticipated by Sellinger et al (US 6,517,958B1). Paragraph no. 7 of the Office Action outlines the Examiner's position that Sellinger discloses a polyhedral material of formula  $(RSiO_{1.5})_n$  which can be functionalized with methacrylate functionalities.

As amended herein, Claim 22 now recites a polymeric chemically amplified resist wherein the methacrylate-containing comonomer is *different than* the polyhedral oligosilsequioxane-containing comonomer. As recognized by the Examiner, Sellinger discloses a polymeric silsequioxane which can be functionalized with a methacrylate moiety, in which the methacrylate moiety and the silsequioxane component are part of the same repeating unit of the polymer.

Further, and in view of the amendment of Claim 22, Applicant respectfully maintains that Claims 25-27 not anticipated by Sellinger, for at least the reason that Sellinger does not anticipate Applicant's polymeric resist of Claim 22.

By this amendment, Applicant respectfully asserts that the rejection of Claims 22 and 25-27 under 35 U.S.C. § 102(e) has been obviated. Accordingly, Applicant respectfully requests withdrawal of this rejection, and allowance of these claims.

**Rejection of Claims 60 and 63 Under 35 U.S.C. § 102(b) in View of Barzynski**

Claims 60 and 63 are rejected under 35 U.S.C. § 102(b) as being anticipated by Barzynski et al (US 3,849,137). Paragraph no. 8 of the Office Action outlines the Examiner's

position that Barzynski (col. 1, lines 5-11) discloses a photosensitive coating material which consists essentially of a polymer containing *o*-nitrocarbinol ester groups.

As amended herein, Claim 60 incorporates the features of Claim 61, namely that the photoacid generating component comprises a sulfonium compound, an ionium compound, or a combination thereof. Barzynski does not disclose a photosensitive material which contains a sulfonium compound or an ionium compound.

Accordingly, by this amendment, Applicant respectfully maintains that the rejection of Claims 60 and 63 under 35 U.S.C. § 102(b) has been obviated. Accordingly, Applicant respectfully requests withdrawal of this rejection, and allowance of these claims.

#### **Rejection of Claim 12 Under 35 U.S.C. § 103(a)**

Claim 12 was rejected in the Office Action mailed October 3, 2003, under 35 U.S.C. § 103(a), as being obvious in view of Kita et al (JP 2000-334881 and its English abstract provided by the Japan Patent Office). It is the Examiner's position that although Kita does not teach the amount of the cage-shaped silsesquioxane to be mixed with the organic polymer, the present range for the amount of the nanoparticle component would have been obvious to one of ordinary skill in the art.

As amended herein, Claim 1 now recites that the nanocomposite resist comprising a nanoparticle component and a polymer component is *photoimagable*. Applicant maintains that Kita discloses a film that is *stable* to radiation, rather than a film that is photoimagable. Nowhere does Kita, in the English abstract provided by the Japan Patent Office, teach or suggest a weight percentage of the nanoparticle component present in the resist that would provide a photoimagable nanocomposite resist.

By this amendment, Applicant respectfully maintains that the rejection of Claim 12 under 35 U.S.C. § 103(a) has been obviated. Accordingly, Applicant respectfully requests withdrawal of this rejection, and allowance of this claim.

#### **Objection to Claims 6, 7, 11, 23, 61 and 62**

The October 3, 2003 Office Action objected to Claims 6, 7, 11, 23, 61 and 62 as to form, but indicated these claims would be allowable if rewritten in independent form. Applicant

respectfully maintains that the amendments herein address this objection, such that each of Claims 6, 7, 11, 23, 61 and 62 defines patentable subject matter and does not depend from a claim that is anticipated. Accordingly, Applicant respectfully requests withdrawal of the objection, and allowance of these claims.

**New Claims 72-82**

By this amendment, new Claims 72-82 are presented. Support for these new claims is found throughout the specification as follows.

Support for new Claim 72 is found in original Claims 1 and 2.

Support for new Claim 73 is found in original Claims 1 and 4.

Support for new Claim 74 is found in original Claim 2.

Support for new Claim 75 is found in original Claim 3.

Support for new Claim 76 is found in original Claim 5.

Support for new Claim 77 is found in original Claim 6.

Support for new Claim 78 is found in original Claim 7.

Support for new Claim 79 is found in original Claim 10.

Support for new Claim 80 is found in original Claim 11.

Support for new Claim 81 is found in original Claim 12.

Support for new Claim 82 is found in original Claim 13.

**CONCLUSION**

The foregoing is submitted as a full and complete Response to the Office Action dated October 3, 2003. For at least the reasons given above, Applicant respectfully submits that Claims 1-5, 8-10, 12-22, 24-28, 30-37, 51-60, 63, 64, and 69-71 define patentable subject matter, as well as new Claims 72-83. Accordingly, Applicant respectfully requests allowance of these claims.

The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to Deposit Order Account No. 11-0855.

Should the Examiner believe that anything further is necessary in order to place the application in better condition for allowance, the Examiner is respectfully requested to contact Applicant's representative at the telephone number listed below.

Respectfully submitted,



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